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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,434	09/18/2003	Hung Liao	100111692-2	8305

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

LEE, HSIEN MING

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,434

Applicant(s)

LIAO ET AL.

Examiner

Hsien-Ming Lee

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-13 and 16-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-13, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remarks

1. The objection drawings is withdrawn.
2. Applicants' cancellation to claims 14 and 15 is acknowledged. Thus, claims 8-13 and 16-18 are pending in the application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishizawa et al. (US 4,329,625).

Nishizawa et al., in Fig. 2B and related text, teach a process for forming a hetrojunction bipolar transistor, comprising:

- forming a collector 11' of a first semiconductor;
- forming a base 13 of a second semiconductor material; and
- forming an emitter 14' of a group III/VI semiconductor (i.e. indium oxide, col. 8, lines 52-55) on the base 13.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2823

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann et al. (US 5,059,546) in view of Nishizawa et al. (US '625).

In re claim 8, Havemann et al., in Figs. 1-8, 9-10 and related text, teach the claimed process for manufacturing a BiMOS microcircuit, comprising:

- forming a buried layer 12 of a first semiconductor material (i.e. n⁺ buried layer) (Fig.1);
- forming a gate oxide 36 for at least one MOS transistor (Fig.3);
- forming a polysilicon layer 48 on the gate oxide 36 (Fig.4);
- forming a base 44 of a second semiconductor material (i.e. p⁻ base) (Fig.4);
- forming a source 104 and a drain 106 for the MOS transistor of a third semiconductor material (i.e. p⁺ layer)(Fig.9); and
- forming an emitter 74 of a silicide on the base 44 (Fig.9).

Havemann et al. do not teach forming the emitter of a group III-VI semiconductor.

Nishizawa et al., however, teach forming the emitter of a group III-VI semiconductor, comprising indium oxide (col. 8, lines 52-55), wherein indium is a group III element and oxygen is a group VI element.

Therefore, it would have been obvious to one of the ordinary skill in the art, at the time of the invention was made, to form the emitter of group III-VI semiconductor, as taught by Nishizawa et al in the method of Havemann et al., since by this manner it would satisfactory form a bipolar photo-transistor.

In re claim 9, Havemann et al also teach after forming the buried layer 12, isolating the buried layer 12 via the field oxide 26 and 32 into pockets.

In re claim 10, Havemann et al also teach forming a deep N⁺ collector 34 (col. 4, lines 6-7).

In re claim 11, Havemann et al also teach utilizing part of the buried layer 34 as a collector; and forming contacts 116, 114, 118, 122, 124 and 120 to the base 44, emitter 74, collector 34, source 104, drain 106 and polysilicon layer 48 on the gate oxide 36, respectively.

In re claim 12, Havemann et al also teach forming wells 12 and 14 of the second semiconductor material in the buried layer.

In re claim 13, Havemann et al. in view of Nishizawa et al also teach a BiMOS microcircuit produced by the process of claim 8.

Allowable Subject Matter

7. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

None of prior art of record, either alone or combination teaches the group III/VI semiconductor is selected from the group consisting of GaS, GaSe, GaTe, InS, InSe, InTe and TIS.

Response to Arguments

9. Applicant's arguments filed 8/19/2004 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 2823

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on Tuesday-Thursday (8:00 ~ 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hsien-Ming Lee
Primary Examiner
Art Unit 2823

Oct. 20, 2004

HSIEN-MING LEE
PRIMARY EXAMINER

10/20/2004